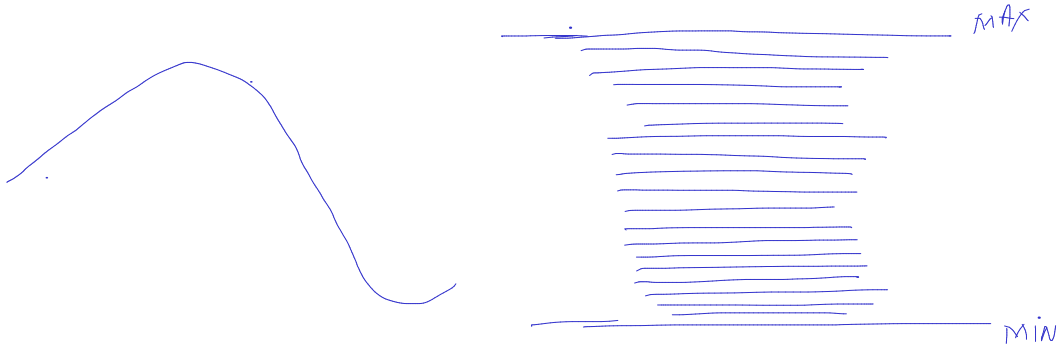
Curs 11



Exercitiul 1 / Lab 9 :

$$y[n] = \frac{1}{2} \cdot y[n-1] + x[n]$$

$$x[n] = \left(\frac{1}{4}\right)^n u[n]$$

Cond. initiale :

$$y[-1] = 0$$

a) Precizie infinita

	x[n]	y[n]
n = 0	1	1
n = 1	1/4	3/4
n = 2	1/16	7/16
n = 3	1/64	15/64
n = 4	1/256	31/256
n = 5	1/1024	63/1024
	↓	↓
	0	0

$$y[0] = \frac{1}{2} \cdot 0 + 1 = 1$$

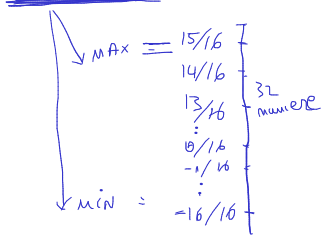
$$y[1] = \frac{1}{2} \cdot 1 + \frac{1}{4} = 3/4$$

$6/16$ ↑

$7/32 \rightarrow \frac{1}{64}$

⋮

b). ISOÎ4F, Trunchiere



	x[n]	y[n]
n = 0	15/16 (0,1111)	15/16 (0,1111)
n = 1	1/4 = 4/16 (0,0100)	11/16 (0,1011)
n = 2	1/16	6/16
n = 3	0	3/16
n = 4	0	1/16
n = 5	0	0/16
	0	0
	⋮	⋮

$1 \rightarrow 15/16$

$1/4 \Rightarrow 4/16$

$\frac{4}{16} = 0,0100$

$$y[1] = \left[\left[\frac{1}{2} \cdot \frac{15}{16}\right]_Q + \frac{4}{16}\right]_Q$$

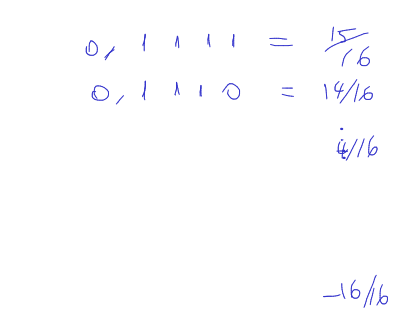
$$= \left[\frac{7.5}{16}\right]_Q + \frac{4}{16}$$

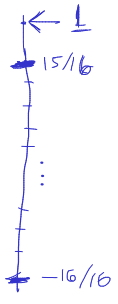
$$= \frac{7}{16} + \frac{4}{16} = \frac{11}{16}$$

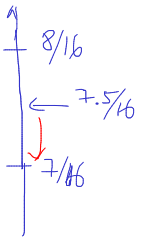
$(0,1011)$

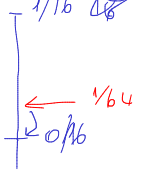
$$y[2] = \left[\left[\frac{1}{2} \cdot \frac{11}{16}\right]_Q + \frac{1}{16}\right]_Q$$

$$= \frac{5}{16} + \frac{1}{16} = 6/16$$









$$\frac{1}{64} = \frac{0.25}{16} \Rightarrow 0$$

c). Rotunjire

$x[n] = \left(\frac{1}{4}\right)^n u[n]$

	$x[n]$	$y[n]$
$n=0$	15/16	15/16
$n=1$	1/4 = 4/16	12/16
$n=2$	1/16	7/16
$n=3$	0 (0,0000)	4/16 (0,0100)
$n=4$	0	2/16
$n=5$	0	1/16
$n=6$	0	1/16
$n=7$	0	1/16 (0,0001)
		= Ciclu Limită

$y[1] = \frac{1}{2}\cdot\frac{15}{16} + \frac{4}{16} = \frac{8}{16} + \frac{4}{16} = \frac{12}{16}$

$\left\lfloor \frac{7.5}{16} \right\rfloor = \frac{8}{16}$

8/16
7.5/16
7/16

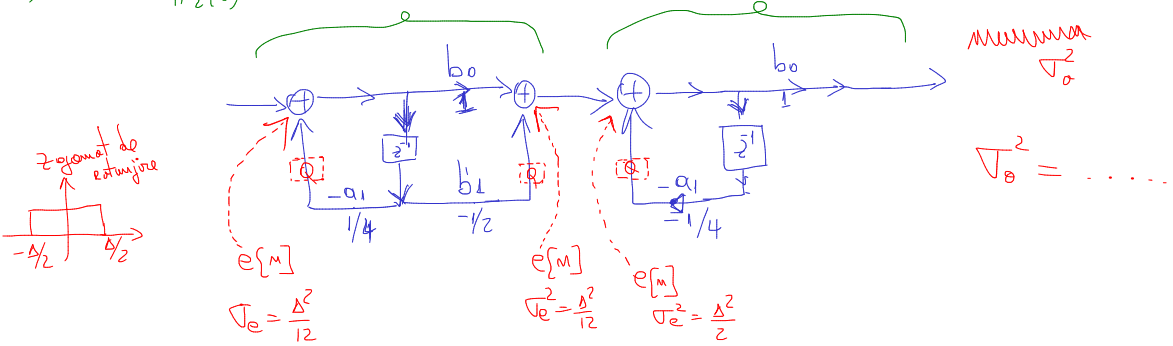
$x[3] = \frac{1}{64} = \frac{0.25}{16}$

1/16 ⇒ 0/16
0/16

Ex. 1 / Lab 10

a) $H(z) = \frac{1 - \frac{1}{2}z^{-1}}{\left(1 - \frac{1}{4}z^{-1}\right)\left(1 + \frac{1}{4}z^{-1}\right)} = \frac{b_0 + b_1 z^{-1}}{1 + a_1 z^{-1}} \cdot \frac{b_0}{1 + a_1 z^{-1}}$

$H_1(z)$ $H_2(z)$



b).

Puterea $\frac{\Delta^2}{12} = \frac{2^{-2b}}{12}$

$\Delta = 2^{-b}$